

Initial Use Of Probabilistic Monitoring Techniques In Tennessee

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Biographical Sketch of Author

Gregory M. Denton is currently the manager of the Planning and Standards Section in the Tennessee Department of Environment and Conservation's Division of Water Pollution Control. His current responsibilities include water quality standards, water quality monitoring and assessment, stream posting, data management, and general planning activities such as workplan development. He has been with the Division of Water Pollution Control since 1982.

Abstract

In January 2000, the Division of Water Pollution Control initiated a probabilistic monitoring study to assess water quality in subcoregion 71i (Inner Nashville Basin), one of five ecological subregions within the Interior Plateau in Tennessee. Chemical, biological, and bacteriological samples as well as flow measurements and habitat assessments were completed at each of 50 randomly selected sites beginning in January 2000 and ending in June 2001 (the winter 2001 quarter was not sampled).

The project was designed to meet the following objectives:

1. Characterize water quality at each of the probabilistic monitoring stations. Document violations of water quality standards and determine the degree of support of designated uses. Identify likely sources of pollutants in impacted segments.
2. Extrapolate probabilistic data to the entire subcoregion, providing information for the development of the statewide assessment report.
3. Compare water quality assessment information extrapolated from probabilistic sampling to historical assessments within 71i to provide a sense of the accuracy of targeted monitoring efforts.
4. Determine if random sampling would identify additional reference quality streams in the subcoregion.

As a follow-up to this project, probabilistic techniques are again being employed in a study of streams below small impoundments. At fifty randomly selected sites directly downstream of small to medium sized dams, streams will be sampled to determine the frequency in which the impoundment of small streams leads to violation of water quality standards. At those locations in which standards are not violated, the conditions or impoundment management techniques that translate into maintenance of water quality values will be identified.

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